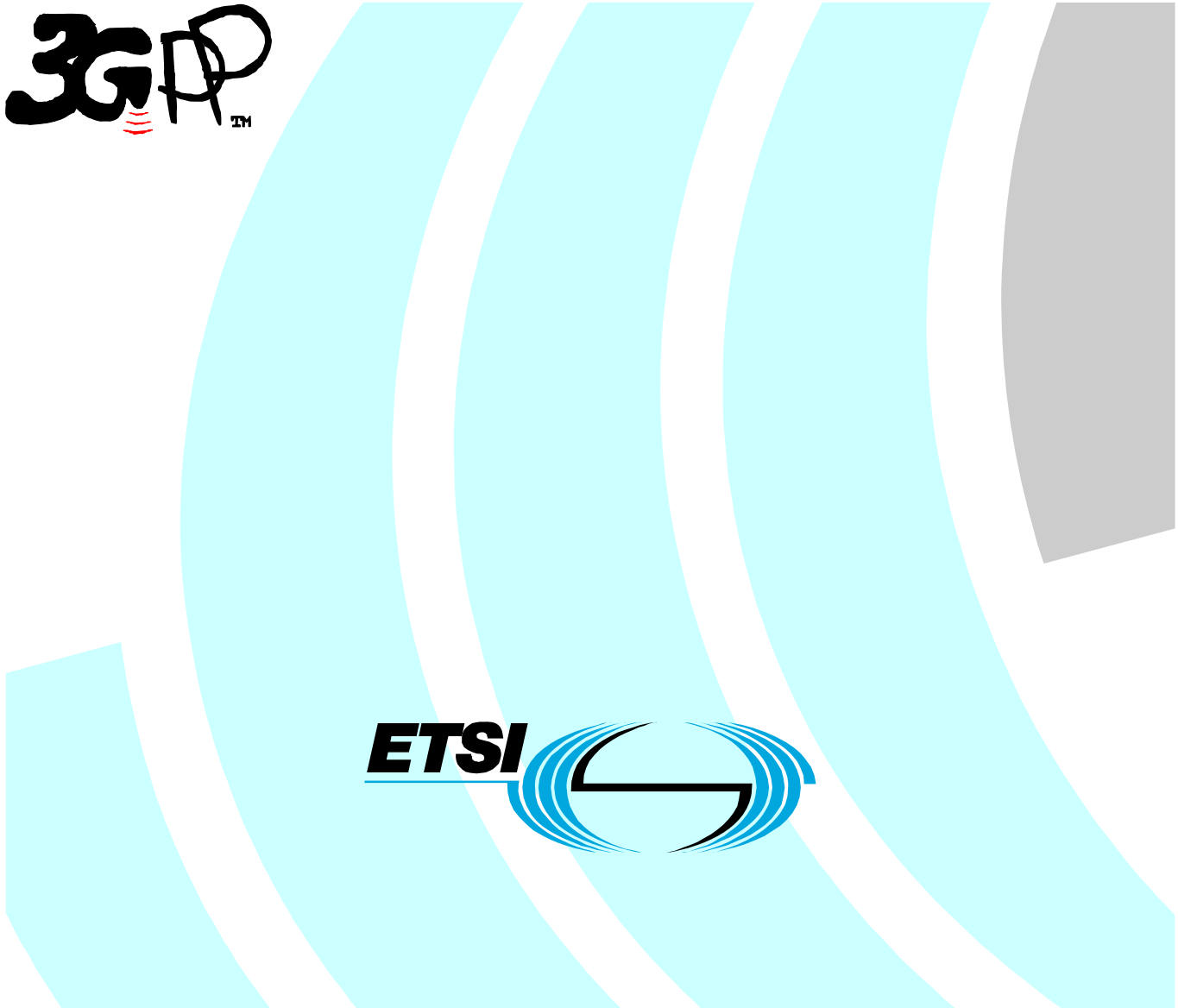
ETSI TS 129 205 V9.1.0 (2010-01)

Technical Specification

Universal Mobile Telecommunications System (UMTS);
Application of Q.1900 series to bearer-independent Circuit Switched (CS) core network architecture;
Stage 3
(3GPP TS 29.205 version 9.1.0 Release 9)



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Contents

Intellectual Property Rights 2
Foreword 2
Foreword 4
1 Scope 5
2 References 5
3 Definitions, symbols and abbreviations 6
3.1 Definitions 6
3.2 Symbols 6
3.3 Abbreviations 6
4 Protocols 7
4.1 Call control protocol (Nc interface) 7
4.2 Interworking with other protocols 7
4.3 Resource control protocol (G)MSC and MGW (Mc Interface) 7
4.4 Bearer control protocol between MGWs (Nb interface) 7
4.5 Signalling Transport 7
4.5.1 Call Control protocols 7
4.5.2 Resource control protocol (G)MSC and MGW (Mc Interface) 7
4.5.3 Bearer control protocol between MGWs (Nb interface) 8
Annex A (informative): Support of Customized Alerting Tone (CAT) service in ITU ISUP/BICC 9
Annex B (normative): Transparent Support of Mobile Services 11
B.1 Introduction 11
B.2 Mobile Service Transport (MST) – Format and Codes 11
B.2.1 Encapsulated Application Information 11
B.2.1.1 General Layout 11
B.2.1.2 List of Identifiers 13
B.2.1.3 Mobile Equipment Identifier 13
B.2.2 Application Transport Instruction Indicators 14
Annex C (informative): Change history 15
History 16

Foreword

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Version x.y.z

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- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
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1 Scope

The present document describes the protocols to be used when ITU-T Q.1902 "Bearer Independent Call Control" is used as call control protocol in a 3GPP Bearer Independent CS core network 3GPP TS 23.205 [1] The Q.1902 operates between (G)MSC servers .The BICC architecture as described in ITU-T Q.1902 [6]-[10] consists of a number of protocols. The following types of protocols are described: call control protocol, bearer control protocols and a resource control protocol for this architecture. The architecture complies with the requirements imposed by 3GPP TS 23.205 [1] and TS 23.153 [2].

The present document is valid for a 3rd generation PLMN (UMTS) complying with Release 4 and later.

Note: Q.1902 can be used in other network architectures than the one defined in 3GPP TS 23.205 [1]

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TS 23.205: "Bearer Independent CS Core Network – Stage 2".

[2] 3GPP TS 23.153: "Out of Band Transcoder Control - Stage 2".

[3] 3GPP TS 29.232: "Media Gateway Controller (MGC) – Media Gateway (MGW) Interface; Stage 3"

[4] 3GGP TS 29.414: "Core Network Nb Data Transport and Signalling Transport"

[5] ITU-T Q.765.5: "Application Transport Mechanism"

[6] ITU-T Q.1902.1: "Bearer Independent Call Control CS2 Functional Description"

[7] ITU-T Q.1902.2: "Bearer Independent Call Control CS2 General Functions of Messages and Signals"

[8] ITU-T Q.1902.3: "Bearer Independent Call Control CS2 Formats and Codes"

Editor's note: The reference above will include the amendment for "multimedia Customized Alerting Tone (CAT) service in ITU ISUP/BICC" (see http://www.3gpp.org/ftp/tsg_ct/WG4_protocollars_ex-CN4/TSGCT4_42_San_Antonio_2009_02/Docs/C4-090471.zip), but this amendment cannot be formally referenced until it is published as a standard ITU-T Q series Recommendation.

[9] ITU-T Q.1902.4: "Bearer Independent Call Control CS2 Basic Call Procedures"

[10] ITU-T Q.1902.5: "Exceptions to the Application Transport Mechanism in the Context of Bearer Independent Call Control"

[11] ITU-T Q.1902. 6: "Generic Signalling Procedures and Support of the ISDN User Part Supplementary Services with the Bearer Independent Call Control Protocol".

[12] ITU-T Q.1950: "Call Bearer Control Protocol".

[13] ITU-T Q.2630.1-2: "AAL type 2 signalling protocol".

[14] ITU-T Q.1990: "BICC tunnelling control protocol".

[15] ITU-T Q.1970: "IP Bearer Control protocol".

[16] ITU-T Q.1912.1: "ISUP-BICC Interworking".

[17] ITU-T Q.1912.2: "Interworking between selected Signalling System (PSTN Access DSS1, C5, R1, R2, TUP) AND THE Bearer Independent Call Control Protocol".

[18] ITU-T Q.2150.0: "Generic Signalling Transport Service".

[19] ITU-T Q.2150.1: "Signalling Transport Converter MTP and MTP3 B".

[20] ITU-T Recommendation Q.2150.3 "Signalling Transport Converter on SCTP".

[21] ITU-T H.248.4: "Gateway Control Protocol: Transport over SCTP".

[22] 3GPP TS 29.202: "SS7 signalling transport in core network".

[23] ITU-T H.248.5: "Gateway control protocol: Transport over ATM".

[24] ITU-T Q.765: "Signalling system No. 7 – Application transport mechanism".

[25] 3GPP TS 23.003: "Numbering, addressing and identification".

[26] 3GPP TS 23.216: "Single Radio Voice Call Continuity (SRVCC); Stage 2".

[27] 3GPP TS 23.237: "IP Multimedia subsystem (IMS) Service Continuity; Stage 2".

3 Definitions, symbols and abbreviations

3.1 Definitions

3.2 Symbols

For the purposes of the present document, the following symbols apply:

Nc Interface between the(G)MSC servers.
Mc Interface between the server and the media gateway.
Nb Interface between media gateways (MGW).

3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

BICC Bearer Independent Call Control
MGC Media Gateway Controller
AAL ATM Adaptation layer
STC Signalling Transport Converter
SCTP Stream Control Transmission Protocol
MTP Message Transfer Part
DSS 1 Digital Signalling System number 1
R1 Regional Signalling System 1
R2 Regional Signalling System 2
TUP Telephony User Part
C5 CCITT signalling system number 5
M3UA MTP3 – User Adaptation Layer

4 Protocols

Implementations providing any of the interfaces or protocols identified in the subclauses below shall implement the requirements of the specifications identified in those subclauses.

4.1 Call control protocol (Nc interface)

Q.1902.1	BICC PROTOCOL (CS2) FUNCTIONAL DESCRIPTION [6]
Q.1902.2	BICC PROTOCOL (CS2) AND SIGNALLING SUSTEM NO 7 ISUP GENERAL FUNCTIONS OF MESSAGES AND PARAMETERS [7]
Q.1902.3	BICC PROTOCOL (CS2) AND SINGALLING SYSTEM NO 7 ISUP FORMATS AND CODES [8]
Q.1902.4	BICC BASIC CALL PROCEDURES [9]
Q.1902.5	EXCEPTIONS TO THE APM IN THE CONTEXT OF BICC AMENDMENT TO Q.765.5 FOR BICC CS2 [10]
Q.1902.6	GENERIC SIGNALLING PROCEDURES AND SUPPORT OF THE ISDN USER PART SUPPLEMENTARY SERVICES WITH THE BEARER INDEPENDENT CALL CONTROL PROTOCOL [11]

4.2 Interworking with other protocols

Q.1912.1	ISUP-BICC INTERWORKING[16]
Q.19.12.2	INTERWORKING BETWEEN SELECTED SIGNALLING SYSTEMS (PSTN ACCESS DSS1 C5 R1 R2 TUP) AND THE BEARER INDEPENDENT CALL CONTROL PROTOCOL[17]

4.3 Resource control protocol (G)MSC and MGW (Mc Interface)

3GGP TS.29232.	Media Gateway Controller (MGC) – Media Gateway (MGW) Interface;Stage 3 [3]

4.4 Bearer control protocol between MGWs (Nb interface)

3GPP TS.29.414	IP bearer control protocol [15] , BICC tunneling protocol [14] , "AAL type 2 signalling protocol (Q.2630.1-2) [13].

4.5 Signalling Transport

4.5.1 Call Control protocols

Q.2150.0	Generic Signalling Transport Service [18]
Q.2150.1	Signalling Transport Converter on MTP3 and MTP3b [19]
Q.2150.3	Signalling Transport Converter on SCTP. [20]
3GPP TS 29.202	SS7 signalling transport in core network . [22] Annex A: SS7 MTP3-User Adaption Layer (M3UA).

4.5.2 Resource control protocol (G)MSC and MGW (Mc Interface)

3GGP TS.29232.	Media Gateway Controller (MGC) – Media Gateway (MGW) Interface;Stage 3 [3] including H.248.4 [21] "Transport over SCTP", H.248.5 [yy] "Transport over ATM" , and 3GPP TS 29.202 "SS7 signalling transport in core network" [22]. Annex A: The use of M3UA in 3GGP networks.

4.5.3 Bearer control protocol between MGWs (Nb interface)

3GPP TS.29.414	Core Network Nb Data Transport and signalling transport. [4] including ITU-T Q.2630.1-2: AAL type 2 signalling protocol [13] and the tunnel-up and tunnel-down procedure in 29.232 [31]

Annex A (informative): Support of Customized Alerting Tone (CAT) service in ITU ISUP/BICC

The following ITU ISUP/BICC protocol evolutions are specified here as required by 3GPP BICC and SIP-I based Nc but are intended to be published as a standard ITU-T Q series Recommendation, pending acceptance and approval via ITU-T SG11.

Parameter and information descriptions would appear in Q.1902.2 as follows:

6.xx forward customized alerting tone indicators: information sent in the forward direction to indicate capability of the calling terminal to participate in multimedia customized alerting tone service and whether priority should be given to the calling party or to the called party's customized alerting tone.

6.xx backward customized alerting tone indicators: information sent in the backward direction to indicate that inband customized alerting tone information is being provided.

7.xx multimedia customized alerting tone (MCAT) capability indicator: information sent in the forward direction to indicate the capability of the calling terminal to participate in multimedia customized alerting tone service.

7.xx customized alerting tone (CAT) priority indicator: information sent in the forward direction to indicate whether priority should be given to the calling party or called party's customized alerting tone.

7.yy customized alerting tone (CAT) content indicator: information sent in the backward direction to indicate that inband customized alerting tone information is being provided.

New parameters and their indicators would appear in Q.1902.3 as follows:

Parameter codepoint: would appear in Table 2/Q.1902.3 as follows:

Parameter name	Reference (clause)	Code	Note
Forward CAT indicators	6.xxx	1 0 0 0 1 1 1 0	
Backward CAT indicators	6.xxx	1 0 0 0 1 1 1 1	

The Forward CAT indicators parameter would be added to the message table for IAM as an optional 3-octet parameter.

The Backward CAT indicators parameter would be added to the message tables for ACM and CPG as an optional 3-octet parameter.

The parameter description clause would appear as follows:

6.xxx Forward Customized Alerting Tone Indicators

The format of the forward customized alerting tone indicators parameter field is shown in Figure yyy.

8	7	6	5	4	3	2	1
spare	spare	spare	spare	spare	C	B	A

Figure yyy/Q.1902.3 – Forward customized alerting tone parameter field

The following codes are used in the Forward CAT indicators parameter field:

Bit A *Multimedia CAT capability indicator*

0 No indication

1 CAT supported

Bits C B *CAT Priority indicator*

0 0 no indication

0 1 Priority given to Calling party (CAT-A)

1 0 Priority given to Called party (CAT-B)

1 1 Spare

See ETSI TS 123.205 for a description of the related service and procedures.

6.xxx Backward Customized Alerting Tone Indicators

The format of the backward customized alerting tone indicators parameter field is shown in Figure yyy.

8	7	6	5	4	3	2	1
spare	spare	spare	spare	spare	spare	spare	A

Figure yyy/Q.1902.3 – Backward customized alerting tone parameter field

The following codes are used in the Backward CAT indicators parameter field:

Bit A *CAT content Iindicator*

0 No indication

1 Inband media content available

See ETSI TS 123.205 for a description of the related service and procedures.

Corresponding amendments would be added to Q.761 and Q.762.

Annex B (normative): Transparent Support of Mobile Services

B.1 Introduction

This Annex specifies a new mobile APM usage "Transparent support of mobile services".

In ITU-T Recommendation Q.1902.3 [8], for the Application Transport Parameter (APP), the following codepoint is defined to refer to this application context identifier (ACI):

0 0 0 0 1 1 1 MST <as defined in ETSI TS 129.205>

The text in ITU-T Recommendation Q.1902.5 [10] shall be followed when implementing this application with the following clarification:

- where the text refers to BAT ASE this shall be interpreted to mean Mobile Service Transport (MST) service.

The MST service shall use implicit addressing; see ITU-T Recommendation Q.765 [24].

B.2 Mobile Service Transport (MST) – Format and Codes

B.2.1 Encapsulated Application Information

B.2.1.1 General Layout

The general layout of the Encapsulated Application Information field of the Application Transport parameter as defined in ITU-T Recommendation Q.1902.3 [8] is shown in Table B.2.1.1.1.

Table B.2.1.1.1: Encapsulated application information field

MSB 8	7	6	5	4	3	2	LSB 1	Octet
Identifier 1								1
Length indicator 1								2
Compatibility information 1								3
Contents 1								4
Identifier n								m
Length indicator n								
Compatibility information n								
Contents n								p

Each information element within the Encapsulated Application Information field has the same structure. An information element consists of four fields which always appear in the following order: Identifier (one octet), Length indicator, Compatibility information, Contents.

The Identifier distinguishes one type from another one and governs the interpretation of the contents. There are two types of Identifiers: type "constructor" and type "simple", for which the contents are defined as follows:

- For a "constructor" type, the Contents field shall again consist of one or more information elements, each of which is structured as described above, i.e., Identifier, Length indicator, Compatibility information, Contents.
- For a "simple" type, the Contents field contains one value only.

When passing on an information element of type "constructor", the order of the information elements within this "constructor" shall be maintained.

The Length indicator specifies the length (i.e., integral number of octets in pure binary representation) of the Compatibility information and Contents. The length does not include the Identifier nor the Length indicator.

The format of the Length indicator is shown in Table B.2.1.1.2. Bit 8 is defined as Extension indicator and indicates whether or not the information on the length continues through the next octet. Value "*0*" of the Extension indicator means "*information continues through the next octet*", while value "*1*" means "*last octet*". The Length indicator itself has a maximum length of 2 octets, i.e., if octet 1a is needed, the Extension indicator of octet 1a is always set to value "*1*".

Table B.2.1.1.2: Length indicator

8	7	6	5	4	3	2	1	Octet
ext.							LSB	1
ext. 1	0	0	0	MSB				1a

The Compatibility information contains corresponding instructions for the case that the received information element is unrecognised. The format of this field is shown in Table B.2.1.1.3.

Table B.2.1.1.3: Compatibility information

8	7	6	5	4	3	2	1	Octet
ext.	pass-on not possible: send notification indicator	pass-on not possible: instruction indicator		reserved	general action: send notificaton indicator	general action: instruction indicator		1

The following codes are used in the subfields of the Compatibility information field.

Bits 2 1 *Instruction indicator for general action*

0 0 Pass on information element

0 1 Discard information element

1 0 Discard MST data

1 1 Release call

Bit 3 *Send notification indicator for general action*

0 Do not send notification

1 Send notification

Bit 4 reserved

Bits 6 5 *Instruction indicator for pass-on not possible*

0 0 Release call

0 1 Discard information element

1 0 Discard MST data

1 1 reserved (interpreted as 00)

Bit 7 *Send notification indicator for pass-on not possible*

0 Do not send notification

1 Send notification

Bit 8 *Extension indicator*

0 Information continues through the next octet

1 Last octet

The Contents field is the substance of the element and contains the information the element is intended to convey.

B.2.1.2 List of Identifiers

Table B.2.1.2.1 contains the list of Identifiers.

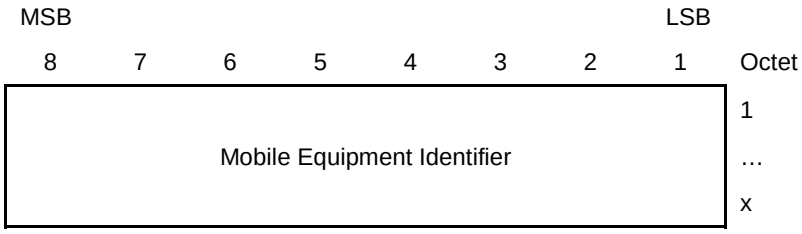
Table B.2.1.2.1: List of identifiers

Value	Information element name	Type	Reference
0000 0000	spare	-	
0000 0001	Mobile Equipment Identifier	simple	B.2.1.3
0000 0010 to 1101 1111	reserved for 3GPP use	-	
1110 0000 to 1111 1111	reserved for national use	-	

B.2.1.3 Mobile Equipment Identifier

The format of the Mobile Equipment Identifier is shown in Table B.2.1.3.1.

Table B.2.1.3.1: Mobile Equipment Identifier



The MEI contains either the International Mobile station Equipment Identity (IMEI) or the International Mobile station Equipment Identity and Software Version Number (IMEISV) as defined in subclause 6.2 of 3GPP TS 23.003 [25].

Both IMEI and IMEISV are TBCD encoded where IMEI is 15 digits and IMEISV is 16 digits. Bits 5 to 8 of octet n+1 (where n represents the octet of the IMEI(SV) being encoded) encodes digit 2n, bits 1 to 4 of octet n+1 encodes digit

2n-1 (i.e. the order of digits is swapped in each octet compared to the digit order defined in 3GPP TS 23.003 [25]). For IMEI, bits 5 to 8 of the last octet shall be filled with an end mark coded as '1111'.

For the use of the Mobile Equipment Identifier (MEI) see 3GPP TS 23.216 [26] and 3GPP TS 23.237 [27].

B.2.2 Application Transport Instruction Indicators

For the MST service the Application Transport Instruction Indicators (ATII) shall be set as follows:

Bits 1 *Release call indicator (RCI)*

0 do not release call

Bit 2 *Send notification indicator (SNI)*

0 do not send notification

Annex C (informative): Change history

Change history							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
17/1/01	CN3/CN4 #66 Beijing			0.1.	New Document approved	-	0.1.0
15/2/01	Ad hoc CN 4#6 in Madrid			0.2	Revised Document approved	0.1.0	0.2.0
01/3/01	CN 4 #7 Sophia—Antopolis			0.3	Forwarded to TSG CN Plenary meeting #11 for approval	0.2.0	2.0.0
03/2001	CN#11	NP-010083			Modifications made during CN#11	2.0.0	2.1.0
03/2001	CN#11	NP-010214			Approved in CN#11	2.1.0	4.0.0
06/2001	CN#12	NP-010285	0001	1	Changes to provide interworking between signalling tansport	4.0.0	4.1.0
09/2001	CN#13				Editorial clean up	4.1.0	4.2.0
09/2001	CN#13	NP-010452	0002		Mc signalling transport in IP environment	4.1.0	4.2.0
09/2001	CN#13	NP-010452	0003	1	BICC signalling transport in IP enviroment	4.1.0	4.2.0
09/2001	CN#13	NP-010452	0004		Status of ITU recommendation Q.2150.3	4.1.0	4.2.0
06/2002	CN#16				Rel-5 created after CN#16	4.2.0	5.0.0
06/2003	CN#20	NP-030220	0006	2	Alignment of references after renumbering of H248 by ITU-T	5.0.0	5.1.0
12/2004	CN#26				Rel-6 created after CN#26	5.1.0	6.0.0
06/2006	CT#32	CP-060298	0009	1		6.0.0	6.1.0
06/2007	CT#36				Upgraded unchanged from Rel-6	6.1.0	7.0.0
12/2008	CT#42				Upgraded unchanged from Rel-7	7.0.0	8.0.0
06/2009	CT#44	CP-090312	0011	2	Amendment for "multimedia Customized Alerting Tone (CAT) service in ITU ISUP/BICC	8.0.0	8.1.0
06/2009	CT#44	CP-090499	0013	1	Mobile Service Application Transport	8.1.0	9.0.0
12/2009	CT#46	CP-090801	0017	2	Introduction of IMEI IE to Mobile APM for SRVCC Emergency Call	9.0.0	9.1.0

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